

# QUALITY INDICATORS RELATED TO GEROPROPHYLAXIS IN CROATIAN NURSING HOMES

NADA TOMASOVIĆ MRČELA<sup>1,2</sup>, BRANKO KOLARIĆ<sup>1,3,4</sup>, JASNA MESARIĆ<sup>5</sup>,  
ANA STAVLJENIĆ-RUKAVINA<sup>5</sup>

<sup>1</sup>Andrija Štampar Teaching Institute of Public Health, Referral Center for Health Care of the Elderly of the Ministry of Health of the Republic of Croatia, Department of Public Health Gerontology, Zagreb, Croatia; <sup>2</sup>University of Split, University Department of Health Studies, Split, Croatia; <sup>3</sup>University of Rijeka, School of Medicine, Rijeka, Croatia; <sup>4</sup>Croatian Academy of Medical Sciences; <sup>5</sup>Libertas International University, Zagreb, Croatia

**Aim:** To determine and compare the values of quality indicators related to geroprophylaxis in Croatian nursing homes in 2017 and 2018, including the incidence of pressure ulcers in the past 90 days, prevalence of malnutrition and obesity, vaccination against influenza in the past 12 months, receiving nine or more medications daily, and the presence of elements of the 5Is geriatric syndrome in nursing home residents. **Participants and Methods:** Data collection was conducted using the Questionnaire on monitoring quality indicators in nursing homes in 160 Croatian nursing homes (county-owned, state and other founders) in 2017 and 2018. Based on the data available, 6 quality indicators related to geroprophylaxis were calculated. **Results:** We received 66 (40%) completed questionnaires in 2017 and 64 (41%) in 2018. There was no statistically significant difference between the two time points for any of the indicators; the median prevalence of malnutrition was 4.9% (IQ=1.2%-8.2%) in 2017 and 5.0% (IQR=2.3-8.1) in 2018; the prevalence of nursing home residents with a body mass index indicating obesity was 16.7% (IQR=7.2%-33.6%) in 2017 and 10.7% (IQR=5.0%-19.4 %) in 2018; the prevalence of residents receiving nine or more drugs per day was 20.6% (IQR=11.9%-34.4%) in 2017 and 22.1% (IQR=13.8%-36.7%) in 2018; the prevalence of residents with elements of the 5Is geriatric syndrome was 25.4% (IQR=9.7%-49.7%) in 2017 and 27.2% (IQR=10.2%-54.1%) in 2018; the prevalence of residents vaccinated against influenza in the last 12 months was 54.1% (IQR=35.8%-76.1%) in 2017 and 62.7% (46.6% -81.7%) in 2018; and the incidence of residents with pressure ulcers developed in the past 90 days was 0.7% (IQR=0%-1.7%) in 2017 and 1.3% (IQR=0.0%-2.3%) in 2018. **Conclusion:** This study showed that the quality indicators assessed did not result in a statistically significant change in Croatian nursing homes over two years. Our research implies that all quality indicators require gerontologic-public health interventions, demonstrating the importance of applying geroprophylactic measures from the Program of primary, secondary, tertiary and quaternary prevention for the elderly in nursing homes.

**Key words:** quality indicators in nursing home, geroprophylaxis, nursing home

**Address for correspondence:** Assist. Prof. Nada Tomasović Mrčela, MD, PhD  
Andrija Štampar Teaching Institute of Public Health  
Mirogojska cesta 16  
10 000 Zagreb, Croatia  
E-mail: [nada.tomasovic-mrcela@stampar.hr](mailto:nada.tomasovic-mrcela@stampar.hr)

## INTRODUCTION

Monitoring and evaluation of quality indicators in nursing homes is particularly important, not only for improving the quality of service, but also for the selection of geroprophylaxis programs (1). Prevention of disease and functional disability in old age is the domain of geroprophylaxis (1,2). Basic geroprophyl-

actic measures are presented in the Program of Primary, Secondary, Tertiary and Quaternary Prevention for the Elderly developed by the Referral Centre for Health Care of the Elderly of the Ministry of Health of the Republic of Croatia – Department of Public Health Gerontology, Dr Andrija Štampar Teaching Institute of Public Health (1-3).

Items of the Questionnaire on monitoring quality indicators in nursing homes include data provided by authorized personnel in the institution and are related to quality domains including the occurrence of elements of the so-called Giants of Geriatric Medicine, i.e. the 5Is geriatric syndrome: immobility, instability, cognitive impairment, incontinence and iatrogenesis (negative outcome of polypragmasy treatment) in residents (1,4). The occurrence of the 5Is geriatric syndrome in the elderly indicates the necessity of implementing a prevention program for the elderly, since its prevention is a priority goal of geroprophylaxis (1,2).

The aim of this study was to determine and compare the values of quality indicators related to geroprophylaxis in Croatian nursing homes in 2017 and 2018. Quality indicators included the items from the Questionnaire on monitoring quality indicators in nursing

homes, i.e. the incidence of pressure ulcers in the past 90 days, the prevalence of malnutrition and obesity, the number of vaccinations against influenza in the past 12 months, receiving nine or more medications daily, and elements of the 5Is geriatric syndrome in nursing home residents.

## PARTICIPANTS AND METHODS

Data collection was conducted from January 2017 to December 2018, covering 160 county-owned nursing homes, state nursing homes, and nursing homes of other founders in Croatia. There were two time points in which questionnaires were collected, i.e. in 2017 and 2018. Based on the data available, 6 quality indicators related to geroprophylaxis (1,5,6) were calculated (Table 1).

Table 1.  
 Quality indicators in nursing homes related to geroprophylaxis (Croatia, 2017-2018)

Indicator	2017		2018		p*
	Median	IQR	Median	IQR	
Residents with established malnutrition	4.9	1.2-8.2	5.0	2.3-8.1	0.979
Residents with established obesity (based on body mass index)	16.7	7.2-33.6	10.7	5.0-19.4	0.321
Residents who receive nine or more medications daily	20.6	11.9-34.4	22.1	13.8-36.7	0.835
Residents who developed pressure ulcers in the past 90 days	0.7	0-1.7	1.3	0.0-2.3	0.731
Residents with elements of the 5Is geriatric syndrome	25.4	9.7-49.7	27.2	10.2-54.1	0.816
Residents who received influenza vaccination in the past 12 months	54.1	35.8-76.1	62.7	46.6-81.7	0.320

\*Two independent proportions test; IQR, interquartile range

All numbers in this table are percentages (%) of the total number of residents (N=9,423 in 2017/N=9,439 in 2018) of nursing homes (N=66 in 2017/N=64 in 2018). Source: Referral Centre for Health Care of the Elderly of the Ministry of Health of the Republic of Croatia, Department of Public Health Gerontology, Dr Andrija Štampar Teaching Institute of Public Health

The Questionnaire on Monitoring Quality Indicators in nursing homes covers many additional items which were not the subject of this study, such as structures of employed elderly health care professionals in nursing homes (nurses with high school, Bachelor's and Master's degree, gerontologic care providers, physiotherapists, occupational therapists); ISO 9001 certification of the institution; functional status of residents; arrival of geriatric dentistry mobile team for the expressed health need of a nursing home resident; usage of standardized questionnaires to assess the resident risk of falls; implementation of categorization procedure based on the program of Four levels of geriatric health care with nursing documentation in the nursing home; implementation of procedures of health care measures by a team of family medicine physicians in a nursing home and the use of services of a specialist physician

for nursing home residents; the application of gerontologic nutrition standards; etc. (1,5). The Questionnaire was developed by Ana Stavljenić-Rukavina, from the EUSUZ Foundation Center for the Promotion of European Standards in Health Care in cooperation with the Referral Center for Health Care of the Elderly of the Ministry of Health of the Republic of Croatia, Department of Public Health Gerontology, Dr Andrija Štampar Teaching Institute of Public Health.

## RESULTS

The questionnaires were sent out to authorized personnel in nursing home by e-mail; 66 and 64 completed questionnaires were received in 2017 and 2018, respectively (response rate was 41% in 2017 and 40% in 2018).

The median prevalence of malnutrition in selected nursing homes was 4.9% (IQR=1.2%-8.2%) in 2017 and 5.0% (IQR=2.3-8.1) in 2018. There was no difference between the two time points.

The median prevalence of nursing home residents with a body mass index (BMI) indicating obesity was 16.7% (IQR=7.2%-33.6%) in 2017 and 10.7% (IQR=5.0%-19.4%) in 2018. Again, there was no statistically significant difference between the two time points.

Among the surveyed nursing homes, the median prevalence of residents receiving nine or more drugs daily was 20.6% (IQR=11.9%-34.4%) in 2017 and 22.1% (IQR=13.8%-36.7%) in 2018 ( $p>0.05$ ).

The median prevalence of residents with pressure ulcers developed in the past 90 days in the surveyed nursing homes was 0.7% (IQR=0%-1.7%) in 2017 and 1.3% (IQR=0.0%-2.3%) in 2018. The difference between the two time points was not statistically significant.

The median prevalence of residents with elements of the 5Is geriatric syndrome in the surveyed nursing homes was 25.4% (IQR=9.7%-49.7%) in 2017 and 27.2% (IQR=10.2%-54.1%) in 2018. Again, there was no difference between the two time points.

The median prevalence of residents vaccinated against influenza in the last 12 months in the surveyed nursing homes was 54.1% (IQR=35.8%-76.1%) in 2017 and 62.7% (46.6%-81.7%) in 2018, again yielding no difference between the two time points (Table 1).

## DISCUSSION

Analysis of the focused gerontologic-public health determinants related to the items of the Questionnaire on monitoring quality indicators in nursing homes direct the programs of geroprophylaxis (Table 1).

Influenza vaccination is a necessary measure of primary prevention in nursing homes to prevent the onset of influenza, as well as the consequent complications of pneumonia, i.e. increased risk of influenza-related mortality in old age (1,7). The geroprophylaxis enhancement program should necessarily allow for and promote higher influenza vaccination rate than in 2017 (median 54.1%; IQR=35.8-76.1) or 2018 (median 62.67%; IQR=46.61-81.67). According to the WHO strategy and action plan for healthy aging in Europe 2012-2020, influenza vaccination is recognized as an important preventive measure achieving the target of 75% coverage in the elderly population (2014-2015) in EU countries (8).

The incidence rate of pressure ulcers in nursing homes in the past 90 days in 2017 (median 0.7%; IQR=0.00-1.7) and 2018 (median 1.3%; IQR=0.00-2.3) requires the use of gerontologic interventions from the tertiary prevention measures program for the elderly, which include monitoring of geriatric patients by using a pressure ulcer risk assessment questionnaire such as the Braden Scale (1,9). A survey that included 17 studies showed the prevalence rates of pressure ulcers in long-term care residents in different countries to vary from 3.4% to 32.4%, whereby the differences were not explained by methodology (10).

Nutritional status determined by malnutrition (indicators) in 2017 (median 4.9%; IQR=1.2-8.2)/2018 (median 5.00%; IQR=2.25-8.05) and obesity (indicators) in 2017 (median 16.7%; IQR=7.2-33.6)/2018 (median 10.7%; IQR=5.0-19.4) in residents of the surveyed nursing homes points to the necessity for continued implementation of primary and secondary prevention measures for the elderly through the Nutritional Risk Screening 2002 (NRS 2002) web service (1).

Gerontologic studies found that approximately 20% of nursing home residents had malnutrition (11). On the other hand, results of the study showed an upward trend in the prevalence of obesity, from 22.4% in 2005 to 28.0% in 2015 in the U.S. nursing home residents (12).

The prevalence of residents with elements of the 5Is geriatric syndrome in 2017 (median 25.4%; IQR=9.7-49.7)/2018 (median=27.2%; IQR=10.2-54.1) and the proportion of geriatric patients taking more than 9 medications *per day* in 2017 (median 20.6%; IQR=11.9-34.4)/2018 (median 22.1; IQR=13.8-36.7) suggest the selection of priority measures of geroprophylaxis and point out that the application of quaternary prevention measures such as regular revision of pharmacotherapy for nursing home residents by the selected family medicine physician is necessary to prevent polypharmacy. The use of multiple drugs in the elderly is a risk factor for adverse drug effects with serious medical consequences (13). A study of quality indicators for the evaluation of drug therapy in Sweden in 2003 found that the average number of drugs prescribed *per resident* in nursing homes was 9 for regular use (14).

In the context of the contemporary geriatric approach, the elements of the so-called Giants of Geriatric Medicine (4) are being redefined in the new concept of GERIATRIC 5Ms: mind, mobility, medications, multicomplexity, and matters most, which requires a comprehensive geriatric assessment by the physician (15).

It is undoubtedly necessary to implement integrated gerontologic health and social care programs in nursing homes that would contribute to the achievement of

the priority goals of geroprophylaxis (1,4,6). A set of gerontologic-public health data obtained by up-to-date application of the Ordinance on the Implementation of the Act on Health Records in the Field of Geriatric Patients Healthcare may also contribute to the selection of targeted measures of geroprophylaxis (16).

## CONCLUSION

This study demonstrated that the quality indicators analyzed did not show a statistically significant change in the Croatian nursing homes between 2017 and 2018. Assessing quality indicators in nursing homes is the first step in the necessary continuous improvement of the quality of care for the elderly. This research showed that all quality indicators related to geroprophylaxis in Croatian nursing homes required a gerontologic-public health intervention, indicating that the application of geroprophylactic measures from the Primary, Secondary, Tertiary and Quaternary Prevention Programs for the Elderly should be continued.

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## S A Ž E T A K

### POKAZATELJI KVALITETE POVEZANI S GEROPROFILAKSOM U HRVATSKIM DOMOVIMA ZA STARIJE OSOBE

N. TOMASOVIĆ MRČELA<sup>1,2</sup>, B. KOLARIĆ<sup>1,3,4</sup>, J. MESARIĆ<sup>5</sup>, A. STAVLJENIĆ-RUKAVINA<sup>5</sup>

<sup>1</sup>Nastavni zavod za javno zdravstvo "Dr. Andrija Štampar", Referentni centar Ministarstva zdravstva za zaštitu zdravlja starijih osoba, Služba za javnozdravstvenu gerontologiju, Zagreb, Hrvatska; <sup>2</sup>Sveučilište u Splitu, Sveučilišni odjel zdravstvenih studija, Split, Hrvatska; <sup>3</sup>Sveučilište u Rijeci, Medicinski fakultet, Rijeka, Hrvatska; <sup>4</sup>Akademija medicinskih znanosti Hrvatske, Zagreb, Hrvatska; <sup>5</sup>Međunarodno sveučilište Libertas, Zagreb, Hrvatska

**Cilj:** Utvrditi i usporediti vrijednosti pokazatelja kvalitete povezane s geroprofilaksom u hrvatskim domovima za starije osobe u 2017. i 2018. godini uključujući učestalost pojave dekubitusa u posljednjih 90 dana, učestalost pothranjenosti i pretilosti, cijepljenja protiv gripe u posljednjih 12 mjeseci, primanja devet ili više lijekova/dan te zastupljenost elemenata gerijatrijskog sindroma 5N kod korisnika domova za starije osobe. **Sudionici i metode:** Prikupljanje podataka provedeno je uporabom Upitnika o praćenju pokazatelja kvalitete u domovima za starije osobe u 160 hrvatskih domova za starije osobe (županijskih, državnih i drugih osnivača) u 2017. i 2018. godini. Na temelju dostupnih podataka izračunato je 6 pokazatelja kvalitete koji se odnose na geroprofilaksu. **Rezultati:** Primili smo 66 (40%) ispunjenih upitnika u 2017. godini i 64 (41%) u 2018. godini. Ni za jedan pokazatelj nije postojala statistički značajna razlika između dviju vremenskih točaka; medijan učestalosti pothranjenosti u 2017. godini bio je 4,9% (IQR=1,2%-8,2%), i 5,0% (IQR=2,3%-8,1%) u 2018. godini; zastupljenost korisnika domova za starije osobe s indeksom tjelesne mase (ITM) koji ukazuje na pretilost bila je 16,7% (IQR=7,2%-33,6%) u 2017. i 10,7 (IQR=5,0 %-19,4%) u 2018.; zastupljenost broja korisnika koji primaju devet ili više lijekova/dan bila je 20,6% (IQR=11,9%-34,4% ) u 2017. i 22,1 (IQR=13,8%-36,7%) u 2018.; učestalost korisnika s elementima gerijatrijskog sindroma 5N iznosila je 25,4% (IQR=9,7% 49,7%) u 2017. i 27,2% (IQR=10,2%-54,1%) u 2018. godini; učestalost korisnika cijepljenih protiv gripe u posljednjih 12 mjeseci iznosila je 54,1% (IQR=35,8%-76,1%) u 2017. godini i 62,7 % (46,6%-81,7%) u 2018. godini, a incidencija pojave tlačnog vrijeda u korisnika tijekom proteklih 90 dana iznosila je 0,7 (IQR=0%-1,7%) u 2017. godini i 1,3% (IQR=0%-2,3%) u 2018. godini. **Zaključak:** Ova studija pokazuje da se analizirani pokazatelji kvalitete u hrvatskim domovima za starije osobe nisu statistički značajno mijenjali tijekom dviju godina. Naše istraživanje ukazuje na to da je kod svih pokazatelja kvalitete potrebna gerontološko-javnozdravstvena intervencija, što upućuje na važnost primjene geroprofilaktičkih mjera iz Programa primarne, sekundarne, tercijarne i kvartarne prevencije za osobe starije dobi u domovima za starije.

**Ključne riječi:** pokazatelji kvalitete u domovima za starije osobe, geroprofilaksa, domovi za starije osobe